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800-531-9977

customerservice@mcelroytranslation.com

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(71) Applicant: 000004329

Victor Company of Japan, Ltd.
3-12 Moriya-cho, Kanagawa-ku,
Yokohama-shi, Kanagawa-ken

(72) Inventor: Yasuhiko Teranishi

Victor Company of Japan, Ltd.
3-12 Moriya-cho, Kanagawa-ku,
Yokohama-shi, Kanagawa-ken

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(54) [Title] BROADCAST SIGNAL RECEPTION DEVICE

(57) Abstract

Problem

It is not possible to check emergency information transmitted along with broadcast signals unless the broadcast signals are being viewed.

Means to solve

When digital broadcast reception part 1 receives broadcasting, the packet of emergency information is extracted by information extraction part 5, and imaging part 7 outputs said packet as text information. An MPEG-TS is supplied from an external device or record/playback part 4 to decoder 8. The text information output from imaging part 7 is superimposed on the program signals decoded by decoder 8. In this way, the user can check emergency information even if the program being broadcast is not being viewed.



Key:

A Digital broadcast signal input
B External digital input
C Analog output
D Digital output
1 Digital broadcast reception
2 Output selection
3 Program extraction
4 Record/playback
5 Information extraction
6 Re-constitution

7	Imaging
8	Decoder
9	Superimposition

Claims

1. A broadcast signal reception device characterized by having a reception means that receives digital broadcast signals including text information,

a text information extraction means that extracts the text information from said digital broadcast signals received by said reception means, and

a superimposition output part that superimposes said text information extracted by said text information extraction means on video/audio information input via an external input terminal or video/audio information being played back from a playback part, and outputs the superimposed information.

2. The broadcast signal reception device described in Claim 1 characterized by the fact that said text information is transmitted in a packet unit provided with a prescribed identifier, and said text information extraction means extracts said text information from said digital broadcast signals based on said prescribed identifier.

3. The broadcast signal reception device described in Claim 1 or 2 characterized by the following facts: it also has a storage means that stores the text information extracted by said text information extraction means;

said reception means and said text information extraction means are always in an operational state; during the period when said superimposition output part is not working, the text information extracted by said text information extraction means is stored in said storage means; when said superimposition output part starts working, the text information stored in said storage means is superimposed on said video/audio information.

4. The broadcast signal reception device described in Claim 3 characterized by the fact that said storage means stores the time when said text information was extracted along with the text information extracted by said text information extraction means in order to prevent the superimposition on the video/audio information of text information that was received more than a prescribed period of time before the current time.

Detailed explanation of the invention

[0001]

Technical field of the invention

The present invention pertains to a broadcast signal reception device that can notify the user of emergency information, such as a news flash, even if the user is not viewing TV broadcast.

[0002]

Prior art

To send disaster information concerning earthquakes or fires or other emergency information (generally referred to as emergency information hereinafter) to viewers via an analog TV broadcast, the broadcasting station superimposes the text information regarding said emergency information on the TV signals and sends the signals with the superimposed information. The viewers can obtain the information regarding a disaster or other emergency by checking the text information displayed on the screen.

[0003]

Problems to be solved by the invention

In said method that superimposes the text information on the TV signals, however, the emergency information will not be sent unless the viewer is viewing the TV broadcast. For example, the viewer will miss said emergency information if he (or she) is watching a movie played back by a videotape recorder, or is watching the broadcast of another channel different from the TV broadcast with the superimposed text information.

[0004]

On the other hand, in a digital TV broadcast, a news flash is sent as a data broadcast. In this case, however, the emergency information cannot be checked unless the channel with the data broadcast is being received. Consequently, the viewer will miss the emergency information when viewing a program using videotape recorder or the like in the same way as when receiving an analog TV broadcast.

[0005]

The objective of the present invention is to solve the aforementioned problems by providing a broadcast signal reception device which can notify the viewer of a news flash or other emergency information even if the viewer is viewing something other than the currently broadcast TV program, for example, a program being played back from a recording medium.

[0006]

Means to solve the problem

In order to realize this objective, the present invention provides a broadcast signal reception device characterized by having a reception means that receives digital broadcast signals including text information, a text information extraction means that extracts the text information from said digital broadcast signals received by said reception means, and a superimposition output part that superimposes said text information extracted by said text information extraction means on video/audio information input via an external input terminal or video/audio information being played back from a playback part, and outputs the superimposed information.

[0007]

Said text information is transmitted in a packet unit provided with a prescribed identifier, and said text information extraction means extracts said text information from said digital broadcast signals based on said prescribed identifier.

[0008]

The reception device can also have a storage means that stores the text information extracted by said text information extraction means. Said reception means and said text information extraction means are always in an operational state. During the period when said superimposition output part is not working, the text information extracted by said text information extraction means is stored in said storage means. When said superimposition output part starts working, the text information stored in said storage means is superimposed on said video/audio information.

[0009]

Said storage means stores the time when said text information was extracted along with the text information extracted by said text information extraction means in order to prevent the superimposition on the video/audio information of text information that was received more than a prescribed period of time before the current time.

[0010]

Embodiment of the invention

In the following, an embodiment of the present invention will be explained in detail based on preferred application examples. Figure 1 is a block diagram illustrating the broadcast

signal reception device disclosed in an application example of the present invention. In this case, the broadcast signal reception device is applied to a device that records/plays back TV broadcast signals.

[0011]

In the figure, 1 represents a digital broadcast reception part that receives input of digital TV broadcast signals and outputs an MPEG transport stream obtained by demodulating said signals (referred to as an MPEG-TS hereinafter). 2 represents a selective output part that selects the MPEG-TS output by the digital broadcast reception part 1, an MPEG-TS input from an external device via an interface not shown in the figure, or an MPEG-TS played back from the record/playback part, to be described later.

[0012]

3 represents a program extraction part that only extracts and outputs the packets of the desired program from the MPEG-TS selectively output from selective output part 2. 4 represents a record/playback part that records the MPEG-TS composed of the packets of the desired program extracted by program extraction part 3, and on the other hand, plays back the MPEG-TS recorded on a recording medium and supplies the playback signals to the input side of selective output part 2.

[0013]

5 represents an information extraction part that only extracts and outputs packets concerning emergency information from the MPEG-TS output by digital broadcast reception part 1. 6 represents a re-constitution part 6 that re-constitutes the packets concerning emergency information extracted by the information extraction part, and the packets concerning the desired program extracted by program extraction part 3.

[0014]

7 represents an imaging part that decodes the packets concerning emergency information extracted by information extraction part 5 and outputs this as text information. 8 represents a decoder that decodes the packets concerning the desired program extracted by program extraction part 3 and outputs this as a program signal. 9 represents a superimposition part that superimposes the text information output by imaging part 7 on the video information of the program signal output by decoder 8. 10 represents a D/A converter that converts the program signal output by superimposition part 9 into an analog signal and outputs said analog signal.

[0015]

In the following, the operation of the broadcast signal reception device shown in Figure 1 will be explained. When the broadcast signals of a digital TV broadcast are input, digital broadcast reception part 1 outputs the MPEG-TS obtained by demodulating said signals to information extraction part 5 and selective output part 2. In this case, the broadcast signal reception device shown in Figure 1 has a record mode that records signals while outputting the received signals or the signals sent from an external device, a signal output mode that only outputs the received signals to the outside, and a playback mode that plays back the signals recorded on a recording medium and outputs the signals to the outside. In the record mode or the signal output mode, selective output part 2 selectively outputs the MPEG-TS from digital broadcast reception part 1 to program extraction part 3.

[0016]

Consequently, when the broadcast signal reception device is in the record mode or signal output mode, program extraction part 3 only extracts the packets concerning a desired program from the MPEG-TS of the received digital TV broadcast and outputs the packets. When program extraction part 3 extracts the packets concerning the desired program, it first searches for a PAT (program association table) having a prescribed PID (packet identification) in the MPEG-TS.

[0017]

When said PAT is found, the PID of the PMT (program map table) regarding the plural programs in the PAT is stored. When the PMT of a desired program is obtained based on said PID, the PID of the video information, the PID of the audio information, and the PID of the additional information of said program are stored in PMT. It is therefore possible to extract only the packets concerning the desired program by obtaining the PAT and PMT of the desired program. Decoder 8 outputs the program signals obtained by decoding the packets extracted as described above.

[0018]

On the other hand, information extraction part 5 only extracts packets having the prescribed PID concerning emergency information from the MPEG-TS output by digital broadcast reception part 1. Imaging part 7 decodes the packets concerning said emergency information and outputs this as text information.

[0019]

Superimposition part 9 then superimposes the text information output by imaging part 7 on the video information of the program signals output by decoder 8. The program signals obtained in this way are output to D/A converter 10. Consequently, D/A converter 10 converts the program signals with superimposed text information and output from superimposition part 9 into analog signals and outputs the analog signals to a display device, such as a monitor, not shown in the figure.

[0020]

Re-constitution part 6 re-constitutes the packets concerning emergency information extracted by information extraction part 5 and the packets concerning the desired program extracted by program extraction part 3. The re-constituted MPEG-TS is output as digital program signals to a display device, such as a monitor, not shown in the figure.

[0021]

As described above, in the record mode and signal output mode the program signals with the superimposed emergency information is output from D/A converter 10, and the packets concerning the desired program and the packets concerning emergency information are output as an MPEG-TS from re-constitution part 6. In the record mode, however, the packets of the desired program extracted by program extraction part 3 are recorded by record/playback part 4 at the same time that they are output.

[0022]

If the packets concerning the desired program extracted by program extraction part 3 are output to decoder 8 and the packets of the plural programs including the desired program are output to record/playback part 4 and re-constitution part 6 instead of the same packets being output to decoder 8 and record/playback part 4 as described above, it is possible for plural programs to be recorded at the same time by record/playback part 4. In this way it is possible to output plural programs and emergency information as an MPEG-TS to the outside.

[0023]

In the following, the operation in the playback mode for playing back an MPEG-TS recorded in record/playback part 4 will be explained. Selective output part 2 selectively outputs an MPEG-TS played back from record/playback part 4 to program extraction part 3. Program extraction part 3 then outputs the MPEG-TS from selective output part 2 to decoder 8 and re-constitution part 6. Decoder 8 decodes the played back MPEG-TS into program signals and

outputs them. If the MPEG-TS played back by record/playback part 4 includes the packets of plural programs, only the packets concerning the desired program are output to decoder 8 by program extraction part 3. It is possible to output the same packets or the packets of plural programs to re-constitution part 6.

[0024]

Here, digital broadcast reception part 1 continuously receives the incoming digital TV broadcast signals even in playback mode. Since the demodulated MPEG-TS is supplied to information extraction part 5, when packets concerning emergency information are received, the text information obtained by decoding said packets is output from imaging part 7 to superimposition part 9.

[0025]

As described above, in the broadcast signal reception device shown in Figure 1, in the playback mode in which the MPEG-TS is played back from record/playback part 4, or the record mode or signal output mode in which the MPEG-TS is output from an external device to the outside, the text information related to the emergency information, transmitted in real time, is superimposed on the video information of the program signals and is output. The viewer can therefore obtain the emergency information even if he (or she) is not viewing the TV broadcast.

[0026]

Also, re-constitution part 6 outputs an MPEG-TS formed by re-constituting the packets concerning the program output by program extraction part 3 and the packets concerning emergency information transmitted in real time to a display device, such as a monitor, not shown in the figure.

[0027]

When the record/playback part 4 in the broadcast signal reception device is constituted with a hard disk drive and two MPEG-TS are handled at the same time by selective output part 2 and program extraction part 3, the MPEG-TS received by digital broadcast reception part 1 and the MPEG-TS sent from an external device are recorded by record/playback part 4, and the MPEG-TS recorded in said record/playback part 4 can be played back. Even in that case, when packets concerning emergency information are received during playback of the MPEG-TS sent from record/playback part 4 or during output of the MPEG-TS from an external device, said emergency information can be made available to the viewer.

[0028]

In the following, an example of applying the broadcast signal reception device disclosed in the present invention to a digital broadcast signal display device will be explained based on Figure 2. In this figure, the same parts as those shown in Figure 1 are represented by the same respective symbols and will not be explained again.

[0029]

In Figure 2, 1 represents a digital broadcast reception part that receives input of digital TV broadcast signals and outputs the MPEG-TS obtained by demodulating said signals. 2 represents a selective output part that selects the MPEG-TS output by digital broadcast reception part 1 or the MPEG-TS input from an external device via an interface not shown in the figure. 3 represents a program extraction part that only extracts and outputs the packets of a desired program from the MPEG-TS selectively output from selective output part 2.

[0030]

5 represents an information extraction part that only extracts and outputs packets concerning emergency information from the MPEG-TS output by digital broadcast reception part 1. 7 represents an imaging part that decodes the packets concerning emergency information extracted by information extraction part 5 and outputs them as text information. 8 represents a decoder that decodes the packets concerning the desired program extracted by program extraction part 3 and outputs this as a program signal.

[0031]

Also, 11 represents an analog broadcast reception part that receives input of transmitted analog TV broadcast signals and outputs the video/audio signals obtained by demodulating said broadcast signals. 12 represents a selective output part that outputs the video/audio signal output by analog broadcast reception part 11 or the video/audio signals input from an external device via an interface not shown in the figure. 13 represents a signal processing part that converts the video/audio signals selectively output from selective output part 12 and outputs the program signals obtained after performing prescribed signal processing.

[0032]

14 represents a selective output part that selectively outputs the program signals output from decoder 8 or the program signals output by signal processing part 13. 9 represents a superimposition part that superimposes the text information output by imaging part 7 on the video information in the program signals output by selective output part 14, and outputs the

superimposed information. 10 represents a D/A converter that converts the program signals output from superimposition part 9 into analog signals and outputs said analog signals. 15 represents a monitor that displays the analog signals output from D/A converter 10 on the screen.

[0033]

In the following, the operation of the broadcast signal reception device shown in Figure 2 will be explained. When digital TV broadcast signals are input, digital broadcast reception part 1 outputs the MPEG-TS obtained by demodulating said broadcast signals to information extraction part 5 and selective output part 2.

[0034]

In this case, the digital broadcast signal reception device shown in Figure 2 has a digital broadcast viewing mode for viewing received digital TV broadcasts, an analog broadcast viewing mode for viewing received analog TV broadcasts, an external digital input viewing mode for viewing an MPEG-TS in digital signal form input from an external device via an interface not shown in the figure, and an external analog input viewing mode for viewing/listening to video/audio signals in analog signal form input from an external device via an interface not shown in the figure.

[0035]

In the digital broadcast viewing mode, selective output part 2 selectively outputs the MPEG-TS from digital broadcast reception part 1 to program selection part 3, and selective output part 14 selectively outputs the program signals from decoder 8 to superimposition part 9. On the other hand, in the analog broadcast viewing mode, selective output part 12 selectively outputs the video/audio signals from analog broadcast reception part 11 to signal processing part 13, and selective output part 14 selectively outputs the program signals from signal processing part 13 to superimposition part 9.

[0036]

Also, in the external digital input viewing mode, selective output part 2 selectively outputs the MPEG-TS from an external device to program extraction part 3, and selective output part 14 selectively outputs the program signals from decoder 8 to superimposition part 9. On the other hand, in the external analog input viewing mode, selective output part 12 selectively outputs the video/audio signals from an external device to signal processing part 13, and selective output part 14 selectively outputs the program signals from signal processing part 13 to superimposition part 9.

[0037]

When the broadcast signal reception device is in the digital broadcast viewing mode or the external digital input viewing mode, program extraction part 3 extracts only the packets concerning a desired program from the MPEG-TS of the received digital TV broadcast or the MPEG-TS sent from an external device, and outputs said packets. When program extraction part 3 extracts the packets concerning a desired program, as described above, only the packets concerning the desired program are extracted by obtaining the PAT and PMT having the prescribed PID. Also, decoder 8 outputs the program signals obtained by decoding the extracted packets, and selective output part 14 selectively outputs the program signals output from decoder 8 to superimposition part 9.

[0038]

Information extraction part 5 receives incoming digital TV broadcast signals not only in the digital broadcast viewing mode but also in the external digital input viewing mode. Since the demodulated MPEG-TS is supplied to information extraction part 5, when the packets concerning emergency information are received, the text information obtained by decoding said packets is output from imaging part 7 to superimposition part 9.

[0039]

Superimposition part 9 then superimposes the text information output by imaging part 7 on the video information of the program signals output by selective output part 14, and outputs the program signals obtained this way to D/A converter 10. D/A converter 10 then outputs the program signals with the superimposed text output from superimposition part 9 to monitor 15, which displays the program signals with superimposed text information on the screen.

[0040]

When the digital broadcast signal reception device is in the analog broadcast viewing mode or the external analog input viewing mode, signal processing part 13 outputs the video/audio signals of the received analog TV broadcast or the video/audio signals from an external device as program signals, and selective output part 14 selectively outputs the program signals from signal processing part 13 to superimposition part 9.

[0041]

Here, information extraction part 5 receives the incoming digital TV broadcast signal. Since the demodulated MPEG-TS is supplied to information extraction part 5, when packets

concerning emergency information are received, the text information obtained by decoding the packets is output from imaging part 7 to superimposition part 9.

[0042]

Consequently, superimposition part 9 superimposes the text information output from imaging part 7 on the video information of the program signals output from selective output part 14, and the obtained program signals obtained this way are displayed on the screen of monitor 15.

[0043]

With the aforementioned broadcast signal reception device, the viewer will miss emergency information unless he (or she) view/listens to some video/audio signal on a monitor. In other words, the viewer will miss the emergency information if the power of the device is off. If digital broadcast reception part 1 and information extraction part 5 are in an operational state even when the power of the device is off and a memory used to store packets concerning emergency information extracted by information extraction part 5 is provided inside information extraction part 5, the viewer will not miss the emergency information even if the power of the device is off.

[0044]

In other words, it is possible to check for emergency information received while device power is off if packets concerning emergency information received while device power is off are stored in a memory and this emergency information is displayed on the screen when the power is turned on. In this case, if the time that the emergency information was received is also stored and the content of the emergency information is displayed along with the time of its reception when the power is turned on, the viewer can grasp the information at any time, even when new disaster information is sent over time.

[0045]

Also, if packets received more than a prescribed period of time before the current time, that is to say old emergency information, is automatically erased from the memory, the memory capacity can be reduced, and confusion caused by the display of old emergency information can be prevented. It is also possible to provide a memory separately from information extraction part 5, instead of installing it inside information extraction part 5.

[0046]

In the aforementioned broadcast signal reception device, after the text information is superimposed on the video information of the program signals, the program signals are subjected to D/A conversion. This, however, is not the only option. It is also possible to superimpose the text information after performing D/A conversion of the program signals.

[0047]

In addition to disaster information for earthquakes or fires, lottery numbers and results of sports events can also be handled as emergency information. A different PID is set for each piece of said information, and the text information is superimposed on the program signals such that only information with the PID set by the viewer in information extraction part 5 beforehand will be displayed on the screen.

[0048]

As described above, it is also possible to send the viewer emergency information using audio information instead of text information. In other words, it is also possible to multiplex audio information broadcast as emergency information with audio information input from an external input terminal or with audio information being played back, and to output this multiplexed audio information.

[0049]

Effects of the invention

By using the broadcast signal reception device disclosed in the present invention, if text information is received during the output of video/audio information from an external input terminal or video/audio information being played back, since the text information is superimposed on the video/audio information and is then output, the viewer can check emergency information transmitted via the digital broadcast signals on the monitor, and not miss it.

[0050]

A storage means that stores the extracted text information during the period when the superimposition output part stops working is adopted. When the superimposition output part starts to work again, the text information stored in the storage means is superimposed on the video/audio information. Therefore, even if the device power is not on all the time, it is still possible to check the emergency information.

[0051]

Additionally, since superimposition of text information received more than a prescribed period of time before the current time is prevented on the video/audio information, confusion caused by outputting old text information can be avoided.

[0052]

Brief description of figures

Figure 1 is a block diagram illustrating the broadcast signal reception device disclosed in an application example of the present invention.

Figure 2 is a block diagram illustrating the broadcast signal reception device disclosed in another application example of the present invention.

Explanation of symbols

1	Digital broadcast reception part
2, 12, 14	Selective output part
3	Program extraction part
4	Record/playback part
5	Information extraction part
6	Re-constitution part
7	Imaging part
8	Decoder
9	Superimposition part
10	D/A converter
11	Analog broadcast reception part
13	Signal processing part
15	Monitor

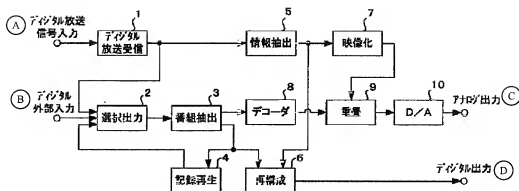


Figure 1

- Key:
- A Digital broadcast signal input
 - B External digital input
 - C Analog output
 - D Digital output
 - 1 Digital broadcast reception
 - 2 Output selection
 - 3 Program extraction
 - 4 Record/playback
 - 5 Information extraction
 - 6 Re-constitution
 - 7 Imaging
 - 8 Decoder
 - 9 Superimposition

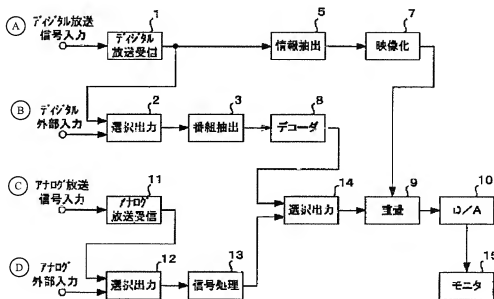


Figure 2

Key:	A	Digital broadcast signal input
	B	External digital input
	C	Analog broadcast signal input
	D	External analog input
	1	Digital broadcast reception
	2	Output selection
	3	Program extraction
	5	Information extraction
	7	Imaging
	8	Decoder
	9	Superimposition
	11	Analog broadcast reception
	12	Selective output
	13	Signal processing
	14	Selective output
	15	Monitor